

## Section of Otology.

President—Dr. DAN MCKENZIE.

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### The Treatment of Traumatic Facial Paralysis.

By E. FARQUHAR BUZZARD, M.D.

THE principles governing the treatment of all lesions affecting the lower motor neurones must of course apply to lesions of the facial nerve, but the path of that nerve through the substance of the temporal bone, where trauma may be inflicted, creates certain difficulties which deserve special consideration. One of these arises from the obscurity which often surrounds the nature and extent of the lesion, the impossibility of determining whether in certain cases the nerve has been completely divided—a rare accident—or whether it has been lacerated, bruised, crushed or merely exposed to the injurious effects of inflammation in adjacent tissues. A second difficulty only affects those instances of complete or nearly complete division which, in the case of other nerves, might call for local surgical intervention in the form of resection and reunion operations which, for anatomical reasons, are precluded in the case of the facial nerve.

Speaking generally, therefore, a facial palsy resulting from a lesion of the nerve in its course through the temporal bone does not call for operative interference, and we have only to consider whether other measures and, if so, what measures are calculated to expedite recovery of function.

These cases of facial palsy may be roughly divided into two main groups. In the first may be included all cases which, after a lapse of three weeks from the onset of palsy, display even the slightest return of function in the facial muscles and in which the muscles do not show the reaction of degeneration to electrical tests. Returning voluntary movement and the absence of reaction to degeneration afford sufficient proof that the continuity of the nerve has not been disturbed, that function has been only temporarily interfered with, and that recovery is merely a matter of a few weeks at most, often much less. It is doubtful whether any treatment will expedite recovery in this group of cases, but gentle rubbing of the facial muscles, followed by the patient's own attempts to carry out facial movements, can be trusted to prevent undue delay. Perfect recovery, uncomplicated by contractures or spasmodic contractions, may be justifiably expected.

In this group of cases, in which the nerve does not go through the processes of degeneration and regeneration, three weeks has been given as the period of time after the onset of paralysis after which signs of returning function may be observed. This is a somewhat arbitrary estimation, as signs of recovery may be further delayed, in the absence of the reaction of degeneration, in cases in which active inflammatory disease persists at the site of the trauma. In such cases, of course, the return of voluntary facial movements may be proportionately postponed.

The second group of cases comprises those in which the reaction of degeneration is present at the end of three weeks from the date of onset. In the majority of such cases only time will show whether regeneration is possible; no evidence of regeneration will be forthcoming until after three or four months, and the question of treatment in the interval has to be decided.

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We are unacquainted with any means by which the regeneration of the nerve may be hastened. We must be content to employ treatment measures calculated to preserve the nutrition and contractility of the degenerated and atrophied muscles and to prevent the development of disfiguring contractures.

The principle of keeping flaccid paralysed muscles unstretched is not so easy to put into practice in relation to the face as it is in the case of the limbs, and the only device for that purpose is a simple apparatus designed to prevent the mouth from being drawn to the opposite side with the consequent stretching of the muscles attached to its angle and upper border. Fortunately the patient, from æsthetic motives, is inclined to inhibit facial movement, and so unconsciously co-operates with the surgeon in avoiding the risk of permanent disfigurement. The nutrition and contractility of the paralysed muscles may be preserved by massage and by compelling contraction by means of the make-and-break of the galvanic current. Probably the regular employment of such measures insures the muscles being in a fit condition to take up their activities again when their innervation has been restored and their regeneration effected. As soon as any voluntary movement is possible re-educational exercises of the muscles before a mirror is the best method of regaining normal control over the features; massage and electrical treatment are no longer necessary.

At this stage post-paralytic contracture often develops, characterized by some permanent shortening of certain muscles and by the patient's inability to discriminate in his facial expressions. Thus, in showing his teeth, the withdrawal of his lips will be accompanied by a strong contraction of the orbiculares palpebrarum, and in closing his eyes he cannot avoid raising the corner of his mouth; a smile is inevitably associated with a compromising wink.

It is doubtful whether this complication can be avoided by any means, and treatment by massage and electricity is of no value once the condition has developed. It is difficult to say for how long it is desirable to use massage and galvanism in the hope of obtaining signs of nerve regeneration; the decision must be modified by special circumstances, but, generally speaking, if there is no return of voluntary movement or of response to the faradic current at the end of six months it is useless to persevere with those methods of treatment.

We have seen this morning the results obtainable from anastomosis in cases of complete and permanent division of the facial nerve. They must be judged on their merits. Personally, my experience of such operations is very meagre and does not justify any decided expression of opinion.

*Discussion.*—Dr. DAN MCKENZIE (President) said that the subject of facial paralysis was near to the heart of every otologist. When the aural surgeon saw a case of facial paralysis after an operation on the ear, the first question he asked himself was, what treatment was required? Did, e.g., the question of making an anastomosis arise? He (the speaker) thought that this question could be settled, most frequently, by considering the cause of the paralysis. What kind of accident to the nerve during the operation had resulted in the paralysis? Those who saw these cases were inclined to conclude that if the nerve had been struck by a blunt instrument or curette the patient would probably recover from the paralysis, and in such cases electrical treatment aided the nutrition of the facial muscles and their consequent return to power. If, however, the nerve had been cut through by a mallet or a sharp chisel or gouge, the question of recovery was more difficult. He (the speaker) thought that most of such cases would recover if left alone. In one case Sydenham had joined the two ends of the severed nerve together; such reunion was a possibility not to be lost sight of. But when a portion of the facial nerve trunk in the temporal bone had been excised, no natural recovery would take place, and in such cases question of the anastomosis operation aroused much interest. Otologists would like to be assured that anastomosis was going to be successful; the operation was still in the experimental stage, and every effort

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must be made to perfect it. At present the results were not always thoroughly satisfactory. He (Dr. McKenzie) did not think that the emotional movements had followed anastomosis, even when the operation had been most successful; both sides of the face did not duly respond to the emotions of the mind. That result, however, might occur in time. But even if only the flaccidity of the paralysed side of the face could be prevented, a great deal would have been achieved.

Mr. A. J. M. WRIGHT said he thought that the six months' limit for recovery given by Dr. Buzzard was too short a time.

Mr. SYDNEY SCOTT said he had seen cases in which the facial paralysis did not begin to disappear, in spite of electric treatment, until three years after the onset of the paralysis.

Sir WILLIAM MILLIGAN said British otologists were to be commended for the rarity of cases of facial paralysis following operation, in comparison with the number of such cases in other countries, and, from what one saw at British hospitals, it was clear that this comparative infrequency was due to the meticulous care which aural surgeons exercised in operating. When the injury did occur, it was, of course, most disfiguring.

In this connexion junior surgeons should be warned that although there was, of course, a danger of the assistant's injuring the nerve in the course of the operation, sometimes the injury arose during the after-treatment, if packing was made too tightly, or if caustics were injudiciously used. Packing the mastoid cavity should be done lightly and gently.

It was difficult to decide how long one should wait before operating, but he, too, thought the period of six months far too short. He had known the nerve to recover after a period of two years. It was essential, when facial paralysis developed, that immediate care should be taken of the facial muscles; the surgeon should anticipate nerve recovery and keep up the tone of the muscles by electrical treatment and massage.

Recently he (Sir William) had had a case in conjunction with Sir Charles Ballance, that of a child suffering from extensive tuberculosis of the middle ear, mastoid and labyrinth: the patient for seven years had been under his (the speaker's) treatment. It had not been possible to get the cavity into a condition sufficiently healthy to warrant an anastomosis operation. During the whole time the patient had had daily massage, and the muscles had been stimulated daily; finally the cavity had healed, the anastomosis operation had been performed, and function was now returning.

Opinions differed as to the type of anastomosis desirable. Whatever nerve might be selected, there was sure to be some discomfort for a time. The point to emphasize was that after anastomosis the same care should be taken as before to maintain the tone of the muscles; definite improvement might not occur for a long time. He (Sir William) had never known complete return of function after an anastomosis operation. He had, however, seen great improvement, and the patients had appeared to be satisfied.

Mr. E. WATSON-WILLIAMS said that a point not dealt with in the paper was the prognostic significance of the time at which the paralysis came on. A paralysis which came on during or immediately after an operation was likely to be much more serious than one which appeared only after two or three days. He had especially noticed that difference after labyrinthectomy, an operation about which he had felt somewhat diffident, because among numerous cases he had not had one without evidence of facial nerve damage; fortunately all the patients had recovered or were on the way to recovery.

Much gratitude was due to Sir Charles Ballance for his new as for his former experimental work on facial nerve anastomosis. Reluctance had sometimes been felt in proposing to use a motor nerve, as the results were not invariably satisfactory from the facial point of view, and might be even less satisfactory with regard to muscles supplied by the eleventh and twelfth nerves. It was helpful to know that anastomosis could be carried out with a nerve which could be spared without inconvenience by the patient.

Sir William Milligan had said that some disturbance always followed the operation. He (the speaker) had twice divided the glosso-pharyngeal nerve and on neither occasion did the patient suffer any appreciable inconvenience, though the first patient had complained for a few days that there was a little stiffness of the throat on attempting to swallow. Therefore the operation might be undertaken with the assurance that at worst it would do no harm. An astonishing discovery was that the glosso-pharyngeal, excluding the nerve to the stylo-

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pharyngeus, would act as a motor nerve, whereas according to the text-books it was purely sensory. The very fine nerves to the pharyngeal plexus were not likely to survive intact, and only the sensory portion of the nerve would remain when it was anastomosed. Physiologists would have to re-write part of their story of the functions of nerves if it was demonstrable that a sensory nerve could be trained to move muscles.

Sir JAMES PURVES-STEWART said that Members were probably aware that work in connexion with hypoglossal-facial and spinal-accessory-facial-anastomosis had been done by Sir Charles Ballance, himself (the speaker) and others, twenty years ago. A clear conception of what was meant by the term "traumatic facial paralysis" was necessary. Did it include trauma during the course of an operation by the surgeon, by his assistant, or by nature, on the middle ear?

It was useless to anastomose the proximal end of a sensory nerve, such as the glosso-pharyngeal, below the level of its motor pharyngeal branches, to the distal end of the facial nerve. Further, the glosso-pharyngeal was a very small nerve, the hypoglossal was larger, and the spinal accessory was largest and easiest to find.

The nerves which gave the best clinical results when used for anastomosis were the hypoglossal and the spinal accessory, and of these two the hypoglossal was the better, because when one divided part of the spinal accessory and attached its proximal end to the distal end of the damaged facial nerve, each time the patient tried to elevate the scapula the face, owing to the action of the spinal accessory, contracted on the paralysed side, and unilateral momentary partial closure of the eye—say by a lady acquaintance in the street—was apt to lead to social misunderstandings. If, however, one chose the hypoglossal nerve for the operation, the patient had a more accurate control over half of the tongue, and male patients, at any rate, could keep the tongue at rest inside the mouth; whilst even female patients would restrain its activity when they found that their faces moved every time they tried to innervate the affected side of the tongue. The chief disadvantage of the use of the hypoglossal was the resulting hemiatrophy of the tongue, but this was overcome after a few weeks, when the patient became habituated to the new conditions.

Mr. G. J. JENKINS referred to a case illustrating an important point, namely, that an anastomosis of the seventh cranial nerve with the descendens hypoglossi might give a very satisfactory result, even when performed four years after the commencement of the paralysis. Again, cases had been known to recover function without operation three years after the onset of the paralysis. He also would be glad to know how long one should wait before operating.

Sir JAMES DUNDAS-GRANT said that at a recent meeting he had read notes of several cases of this kind. In one the paralysis had seemed to be complete, but a change for the better had taken place after the employment of digital massage. In another, the use of the anodal pole of a mild galvanic battery had had an excellent effect. This pole had been found better than the negative pole, and less likely to cause contracture. There had been a case in which traumatism was uncertain, but in which also the paralysis had seemed to be complete. He (Sir James) had used faradism merely with the object of demonstrating its uselessness, and, to his surprise, it at once restored the most active movements. In fact, the nerve had recovered but the cortical centre had "hung fire." Judging from his own experience, it seemed that it was in simple operation for acute cases rather than in the radical operation that there was most liability of damage to the facial nerve. In one case he was sure that if he had been allowed to operate earlier the temporary paralysis would not have taken place. During the radical mastoid operation the landmarks were more clearly under the surgeon's view. He (Sir James) had shown a boy suffering from facial paralysis and tuberculous disease of the middle ear and mastoid. He had been under observation several years, and though no improvement with regard to facial paralysis had been expected it had now entirely disappeared.

Mr. M. VLASTO said that facial nerve anastomosis was not without operative risk, apart from that of infection. After the complete division of the facial nerve, one step in the operation, the face on the affected side lost what little tone it had possessed, and the immediate effect was to render the paresis more obvious. Another risk had come under his notice recently, namely, paralysis and atrophy of the tongue on the side of the anastomosis supervening several days after the operation.

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The cases of facial paralysis which he (the speaker) had seen were due either to pathological processes over which the surgeon had very little control, or to an error in surgical technique. He was not familiar with the type of case in which paralysis had ensued as a result of injudicious cauterization. Cauterization in his cases was carried out only at a much later stage, when the facial nerve was well protected by granulations.

He believed that the scarcity of cases of facial paralysis seen in this country might be due less to the caution of British surgeons than to their over-timidity in bevelling down the posterior meatal wall, thus increasing the difficulty of the after-treatment.

Mr. LIONEL COLLEDGE said that in the cases which recovered signs of recovery had almost always appeared by the end of four months. If no signs had appeared at the end of six months, recovery was unlikely; if none were evident at the end of a year recovery was extremely improbable. Cases which recovered spontaneously after a longer interval must be so exceptional that it was not justifiable to take them into account in arriving at a decision about the anastomosis operation. Still, the two cases he (the speaker) was now exhibiting showed that recovery could take place two or even four years after the onset of the paralysis. Sir William Milligan had insisted on the importance of treatment in the meantime, but neither of these patients had had any such treatment, so that apparently this was not essential to the recovery of the muscles.

It should be strongly emphasized that, whatever nerve was employed in the operation, the whole trunk should be employed. If a mere end-to-side anastomosis was made there could be no hope of dissociated movement.

Dr. C. P. SYMONDS said that one explanation of some of these cases of long-delayed recovery was that we were dealing with a functional perpetuation of what had been an organic disability. As Dr. Buzzard had pointed out, a patient with facial palsy learned to inhibit the movement on the other side of the face to some extent, and was, as it were, "going slowly" with the whole of his face. If one allowed the patient to be merely passive and simply treated him by massage and electricity, there was the danger that when regeneration occurred he might not exploit it adequately. Thus there was much to support Dr. Buzzard's argument that attempts at active movement should be combined with massage, the patient being encouraged frequently to practise movements in front of the mirror.

## ILLUSTRATIVE CASES.

**Post-operative Facial Paralysis.**

By DAN MCKENZIE, M.D.

A BOY, aged 3. Schwartz's operation eighteen months ago; complete facial paralysis left, noticed day after operation.

Recovery is progressing. Note an unusual feature, the replacement of the normal closure of the left eyelid in spontaneous winking by a twitch at the angle of the mouth.

**Glosso-pharyngeal Facial Anastomosis for Facial Palsy following successful Trans-labyrinthine Drainage for Meningitis.**

By E. WATSON-WILLIAMS, M.C., F.R.C.S.Ed.

MRS. L. J., aged 56. Admitted February 11, 1926, with purulent meningitis; labyrinth "dead." At operation the whole labyrinth found destroyed by large cholesteatoma, through which facial nerve ran. Posterior fossa drained through internal auditory meatus; facial nerve divided. Complete facial paralysis with reaction to degeneration.

October, 1926.—Proximal end of glosso-pharyngeal nerve (excluding nerve to stylo-pharyngeus) united end-to-end to facial nerve, divided at the stylo-mastoid foramen.